Philosophia Mathematica de Nihil

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ABSTRACT. In this paper, we address a new way of representing 'nothingness' in mathematically supported philosophical terms. This paper also looks to propose a 'new' non-fractional, non-negative number that is basically less than zero as a symbolic representation of nothingness.

Introduction

Since the notion of nothingness is so much interrelated with other not so well defined concepts like 'existence', 'reality', 'consciousness' . . ., an underlying definition has stayed out of sight.

The trial of defining nothingness is a direct reflective implication of inferentially proving that 'nothingness' is something --- highly self-contradictory. In other words, anything that begins with "Nothingness is . . ." will be confined into a paradoxical arrangement of claiming its opposite mission or will be subsided to ultimately purport that nothingness has an attribution of something.

It is arguable that after assigning a term to a certain condition or phenomena whether it is possible to reach a sensible deduced statement that denies the existence of what has been represented by the terms, or not. One may respond to this by underlining that there is no natural connection between a represented entity and its nomenclature. But it is clear that there is a conscious experience or a cognitive symbolization that lies before the naming and similar other processes. Due to this representation of 'nothingness', it is not possible to reach a definition. Or, to do so, 'nothingness' needs to be defined in a way that it can be universally ignored like 'it' is 'nothing'. This is again paradoxical as the main functionality of definition itself is to shed light on the assigned definiendum. Perhaps, defining nothingness in its most objective and scientific sense (free from its common assumptions in East Asian religious philosophies) is a very demanding task in its entirety.

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The mathematics of nothingness begins with defining what ‘nothing’ is. Mathematics is a study of science. It focuses on what exists and what is assumed to have a possibility of existence. It gives those things model, quantization, generalization and numerical representation. Is mathematics obliged to study what nothing is? Should nothing be studied? Does studying its complexion makes nothingness lose its very nature --- being nothing?

This paper efforts to segregate the issue of nothingness from its religious and cultural ties and tries to give it a more inclusive definition. In this quest of representing nothingness unto objective sciences, on the behalf of objective sciences, the existing mathematics claims that nothingness is represented within its reach under a sole symbolization of ‘the empty set’, which is believed to be the one of the fundamental cores of mathematics.

Nothingness

There are many questions around the issue of nothingness. Does it even exist? If it does exist, does that mean, there is no such thing like ‘nothingness’? If we follow from that do we end up saying that the existence of nothingness justifies its main characterization --- its absolute non-existence?

The demarcation of emptiness and nothingness has been famously emboldened by almost every scientific inquiry that looked unto ‘nothingness’. Mathematics, on its behalf, claims that nothingness is represented by the ‘empty set’. To follow this, to support it, or to argue with it, it is necessary to contemplate the ‘set’, and more importantly, ‘the empty set’.

The mathematics of empty set doesn’t fall far from its nomenclature. It is nothing, but, empty. It shouldn’t have been used as an icon for nothingness. Nothingness is the non-existence of set itself. It is not the ‘emptiness’ of a set that must have been used. The issue of nothingness is not about the attainment of the lowest natural cardinality, zero. It is beyond that.

This paper defines nothingness in the following way:

Nothingness is the non-existence of the potential capacity of being empty.

The potential of being an empty and the potential of being full to a certain quantization are parallel things. If a set is an empty set, there exists a potentiality through a certain structural change that this set could have achieved a non-empty value.

For example, the solution set of 2**x = -1 is empty set.

Why is it an empty set?

It is because this 'empty' set holds some mathematical assumptions. What seems 'nothing' of this 'empty set' is its mere display. But it is not. The set holds a mathematical theorem into account. In our example, whose solution set is 'empty set', holds a certain rule that an exponential function couldn't take a negative value as a solution under a certain defined domain. Empty set says, "There is nothing in here". 'Here' is our mathematical domain we used for producing solutions, 'here' is our spatial and temporal setting where elements are set to the possibility of existence.

Nothingness, in its absolute silence, says, "There is no 'here'".

An empty set contains reflections of abstractly and non-elementally represented things, such as unfetched physical space, unfulfilled set of rules under a certain domain and etc.

The cardinality of an empty set is, $n(E) = 0$.

There is no cardinality in the notion of nothingness.

While arguing the faulty representation of nothingness by an empty set, I also have speculations that the mathematical community had nothing to do with the kind of nothingness that has no cardinality. It has always appeared, at least for the mathematical community, as abstract as out-of-reach, as empty as ignorable, as blurred as nothing-to-see and as dull as nothing-to-examine.

This, seemingly, insignificant conceptuality, however, is too big to be ignored inside the room of language of all sciences, mathematics. This paper tries to give 'nothingness' a place that it deserves in the objective sciences.

PART TWO

Nothingness and the Role of Dimensionality

1. Elementary Proof of Rachel's Theorem and its Interpretation

Dimensionality is the number of dimension something has. For example the human world is of three dimensions. Hence, its dimensionality is three.

Theorem 1.0 (Rachel's Theorem, Theorem of Hierarchical Dimensionality): For an entity under a dimensionality, D1, with **n** number of components, it is not possible to construct a set of sequences of events whose elements have **r** number of components in such a way that **r > n**.

Proof 1.0: Theorem 1.0

Let all events of A with a dimensionality of D1 make a set, X.

$X = \{R, S, T, U \ldots\}$

Let the set of components of D1 make a set, E.

$E = \{i, j, k, l \ldots\}$ i.e. $n(E) = n$ (Theorem 1.0)

This means that the elements of X are resultants of their components that can be expressed in terms of the elements of E.

Let components of elements of X, $X_{i, j, k, l \ldots}$, make a set W.

$W = \{(R_i, R_j, R_k, R_l \ldots), (S_i, S_j, S_k, S_l \ldots), (T_i, T_j, T_k, T_l \ldots), (U_i, U_j, U_k, U_l \ldots) \ldots\}$

This would be further interpreted as:

$W = \{W_1, W_2, W_3, W_4 \ldots\}$

$W_1 = \{R_i, R_j, R_k, R_l \ldots\}$

$W_2 = \{S_i, S_j, S_k, S_l \ldots\}$

$W_3 = \{T_i, T_j, T_k, T_l \ldots\}$

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$W_p = X_{[\,]\,E\,(\,)}$

$n(W_1) = n(R \times E)$

The maximum value of $n(R \times E)$, $Max(n(R \times E)) < n(E) <= n$

The same follows for all W_1, W_2, W_3 . . . W_p. Let the number of elements of each cross product with r_i, i.e. as r_1, r_2, r_3, r_4 . . . for $n(R \times E)$, $n(S \times E)$, $n(T \times E)$, $n(U \times E)$ . . . respectively.

And let $H = \{r_1, r_2, r_3, r_4 \ldots\}$.

From the above logical mechanism, it is certainly deductable:

$$\forall\, r \in H, r < n$$

Proof 1.0 shows that no entity in universe can experience another entity with a dimensionality that excels its own.

An entity cannot experience a dimensionality that excels the one of its own.

I will show how Proof 1.0 achieved proving this deduction in the following section: '*Explicit interpretation of Proof 1.0*'

Explicit Interpretation of Proof 1.0

This interpretation of proof 1.0 proceeds by making 'our' known universe as illustrative domain, represented by A in the proof. D1 represents the dimensions of this universe. In our case, D1 holds space and time. Space has three components of its kind (it is expressed in terms of its components). Often, time is considered as the fourth dimension which is endowed with entropy-given directionality.

Set X represents a collection of each end every event that has ever happened in A denoted by a symbol of its own. Set E represents components of D1. In this illustrative case, these are length (x), width (y), height (z), time (t).

$$E = \{x, y, z, t\}$$

Each and every event is expressed in terms of the elements of E. While set X contains each and every event, set W contains the component based description of X. In the measurement of vectors, for example, set X can be: {A, B, C, D . . .}. For given values of set X, set W can be: {((Ax, Ay), At), ((Bx, By, Bz), Bt) . . .}. Set W is the component set for elements of set X.

Therefore, as a particular event in set X is fetched into set W only after picking a subscript component from set E, it is obvious that no single component grouping of any element in set X can have a number of components that excel the number of elements in set E. To rephrase this in our formerly established illustrative mechanism, no event in 'our' known universe happens without the dimensionality of the universe that we know.

2. Interpretation of Rachel's Theorem

Science is about detecting and measuring patterns inside the sequence of events that happened. Science is organized and oriented observation. In this whole process, there is dimensionality of the 'observer' and dimensionality of the 'observed'. Following directly from Rachel's theorem, an observer with a dimensionality Dx, cannot observe an entity with a dimensionality of Dy, in such a way that Dy > Dx.

One can produce infinitely many sets from set X (of Proof 1.0) under a certain attribution. Emptiness is the non-existence of an element from a domain that does fulfill the pre-assigned attribution. Nothingness is the impotence of not creating an attribute at all because the attribute to be assumed is not supported by the workings of the dimensionality one exists.

In this regard, nothingness appears to be relative. What exists in a world of one format of dimensionality is in the realm of nothingness for the other. Emptiness is an observed and measured non-existence. Nothingness is unobservable, unmeasurable non-existence. Be there a world with different format of dimensionality or not, it is totally decidable to say that if there is one, it is entirely impossible to fully detect events that run inside that dimensionality. Such a world will remain in nothingness because our science (or our organized observational instrument) is short of reach of such an existence.

Let the dimensionality of an observer's domain be Dx. And let the dimensionality of an entity's domain be Dy. From the proof of Rachel's theorem and its direct logical consequence, the following mathematical relation (Rachel's Dimensional Distinction) holds:

$$\frac{\boldsymbol{Dx}}{\boldsymbol{Dy}} \geq \mathbf{1} \Rightarrow \boldsymbol{E} \qquad\qquad \frac{\boldsymbol{Dx}}{\boldsymbol{Dy}} < \mathbf{1} \Rightarrow \boldsymbol{N}$$

Where E and N refer to the existence and nothingness respectively.

Due to the relativistic nature of nothingness we have shown, if an entity has a dimensionality less than the dimensionality of the observer it 'exists' from the observer's frame of reference. And if an entity has a dimensionality greater than that of the observer's, it is 'nothing' from the observer's frame of reference. The role of dimensionality in the existentiality of our universe is so intense that without it, there is no clear demarcation between what exists and what doesn't.

In the end of this paper, we have brought the idea that nothingness must be equally represented as an amount that we don't know, a quality with an unobservable quantization as it is represented as a mere dark absolute non-existence.

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PART THREE

The Need For A New Number

We have found the following statement to be mathematically self-evident:

> *A single quantitative representation, including any of the numbers, cannot represent more than one amount.* (Proposition 3.0)

The empty set appears to be an anomaly to this self-evident mathematical statement. The empty set is forced to represent both nothingness and emptiness at the same time.

The axiom of the empty set reads, "The empty set is a set with no elements". As we have shown in earlier parts, nothingness is very well different from what the empty set reflects to conveyance. Therefore, since nothingness is equally the existence we couldn't observe as it is solely 'nothing', we propose a new number as a symbolic representation for 'nothingness'.

The empty set cannot be allowed to bear the representational burden of symbolizing the emptiness of something and the impotence of being empty at the same time.

Continued . . .

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